

# EECS 2032

## Lab 7 Fall 2020

In this lab, you will learn how to deal with arrays and logical thinking

### Problem 1

Write a C program that shows the frequency of English alphabet in a file.

The input is a text file that contains Letters, numbers, white spaces, commas, semicolon, new lines, .....

Your job is to isolate letters, and calculate the frequency of each letter in the input. Note that it doesn't matter if the letter is capital or small letter, a letter is a letter. The frequency is relative to the total number of letters (not characters in the file).

The output is as shown

A 32.31%

B 16.29%

....

And so on

**Input** from standard input, much better if you prepare a file and redirect the input using `a.out < my_input File`

**Output** Each line contains a capital letter (ordered A to Z) followed by a tab, then the frequency as a floating-point number with two digits after the decimal point followed by the percentage sign.

Submit the file as **lab7\_1.c to LAB7**

### Problem 2

Write a C program that accepts inputs as follows

**Input** three lines

The first line is an integer ( $n$ ).

The second line is an array A of chars (all CAPS) of size  $n$  (so spaces) but may contain symbols (`, + = ...`)

**Specification**

The third line is an array B (the same as A but different values).

The program compares the characters in the same position in both A and B looking for the longest match.

**Output**

Two integers separated by a tab. The first integer is the starting position of the longest match, the second is the length of the match

## Example

A = A S H J K M N P L H H R V Y U O P  
B = J h H J P L B S L H H R M N O P Q

There are 2 matches longer than one (shown in red).

The first is HJ and starts at location 2 (we start at location 0) and of length 2

The second is LHHR and start at location 8 and of length 4

The output should be

8 4

Submit as **lab7\_2.c to LAB7**

## Problem 3

Repeat problem 2 with a much looser definition of *match*.

In this case, the match doesn't mean necessarily the same letter, but it means the same letter, the letter just before it in the alphabet, or the letter after it in the alphabet.

For example, H matches G, H, or I

A matches A or B

Z matches Y or Z

Submit as **Lab7\_3.c to LAB7**